

Amendments to the Specification

Please add the following heading after the title of the invention on page 1:

Background of the Invention

Please replace the heading on page 1, line 5 with the following rewritten heading:

Background ~~at~~ Art

Please replace the paragraphs beginning on page 1, line 6 and ending on page 2, line 4 (starting with "Conventionally, some four-cycle") with the following rewritten paragraphs:

Conventionally, some four-cycle engines mounted on a type of motorcycle, a scooter, have a cylinder axis line extending toward the front part of a vehicle, with an intake system connected to the upper face of a cylinder head, and with an exhaust pipe connected to its bottom face. A ~~S~~o called SOHC valve system is used in most of the engines of this kind, in which a single cam shaft is made to drive both an intake valve and an exhaust valve. In this type of valve system, the intake valve and the exhaust valve ~~is~~ are connected respectively via a rocker arm to an intake valve cam and an exhaust valve cam formed on a cam shaft.

Besides the SOHC described above, there is a DOHC valve system used in a four-cycle engine mounted on other types of motorcycle, in which an intake valve and an exhaust valve are driven respectively by each individual cam shaft. A ~~V~~valve system of the DOHC engine is to be, in general, equipped with a valve lifter taking the shape of a bottomed cylinder at the end of the intake valve and at the end of the exhaust valve respectively, and a cam on an intake cam shaft or on an exhaust cam shaft is closely contacted with the top face of the valve lifter. The valve lifter is slidably fitted into a valve lifter guide hole in a cylinder head, and positioned along the axial line of the intake valve and the exhaust valve. In addition, a thin plate shim is interposed between the internal bottom face of the valve lifter and the intake valve or the exhaust valve for adjusting the gap between the top face and the circular base area of the cam (valve clearance).

Inventor It is desired to improve the driving performance of a scooter by adopting the DOHC valve system described above in the scooter engine.

Please replace the heading on page 2, line 18 with the following rewritten heading:

{Disclosure of the invention} Summary of the Invention

Please replace the paragraphs beginning on page 2, line 19 and ending on page 3, line 9 (starting with "In consideration of") with the following rewritten paragraphs:

In consideration of the circumstance described above, this invention was made intending to prevent the valve lifters and the shims from falling-off during the maintenance work when the DOHC engine is mounted on a scooter.

This invention is an arrangement that, in a scooter engine having a valve lifters interposed between intake valves and a cam shaft, as well as between exhaust valves and a cam shafts, with its cylinder axis line extending toward the front part of the vehicle body, a stopper is provided in the cylinder in the opposing position to a top face of the valve lifter a stopper opposing to a top face of the valve lifter is provided such that it is secured removably in the cylinder and a gap is maintained between the top face and the stopper when the circular base area on the cam shaft is cam-engaged with the top face of the valve lifter.

According to this an embodiment of the present invention, the top face of the valve lifter is abutted against the stopper when the valve lifter moves to fall off the cylinder as the cam shaft is removed from the cylinder, thus the valve lifter is prevented from falling off the cylinder by the stopper. In this way, the valve lifter will be kept assembled to the cylinder even when the cam shaft is removed during the maintenance work. In other words, the DOHC engine can be installed on a scooter while preventing the valve lifter from falling off in the course of maintenance work.

Please replace the heading on page 3, line 15, with the following rewritten heading:

{Brief Description of Drawings}

Please replace the paragraph at page 3, lines 22-23 (starting with "Fig. 5 shows a stopper") with the following rewritten paragraph:

Figs. 5(a)-5(b) shows a stopper, in which Fig. 5(a) shows its plan view, Fig.5(b) shows its front view, and Fig. 5 (c) shows its side view.

Please replace the heading on page 4, line 1, with the following rewritten heading:

~~{Best Mode for Embodying Detailed Description of the Invention}~~

Please replace the paragraphs beginning on page 4, line 17 and ending on page 6, line 8 (starting with "Since the cylinder 7 is") with the following rewritten paragraphs:

Since the cylinder 7 is projecting from the crankcase 4 toward the vehicle front and obliquely upward, the axis line C of the cylinder 7 is extending in a forward and obliquely upward direction. In this embodiment, the axis line C is slightly inclined upward toward the front part, extending to the point at the vicinity of the upper edge of a front wheel 15.

The cylinder head 12 removably supports two each of the intake valves 16 and the exhaust valves 17, and also supports a valve system 18 for driving these intake valves 16 and the exhaust valves 17, a spark plug (now shown), and the like. An intake system 19 is connected to the upper surface of the cylinder head 12, and an exhaust pipe 20 is connected to its bottom surface. When the engine 2 is mounted on the scooter 6, the axis line C1 of the exhaust valve 17 is inclined to extend downwardly toward the front part, as shown in Fig. 2 and Fig. 4. As shown in Fig. 1, the exhaust pipe 20 is extended rearward from the cylinder head 12 passing along the area to the right of the crankcase 4, and is connected to a muffler 21 in the area to the right of the rear arm 9.

In Fig. 1, the object provided forward of the engine 2 and indicated with a reference numeral 22 represents a fuel tank. Another object located forward of the fuel tank 22 and indicated with a reference numeral 23 represents a radiator. In addition, a storage box 24 is provided above the engine 2. The storage box 24 is formed with the capacity to accommodate 2 (two) helmets (not shown), with its access opening located in the upper part being opened and closed by a seat. The portions within the storage box 24 for accommodating each of the two helmets are shown with reference numerals 24a and 24b. Further in Fig. 2, the numeral 25 indicates a combustion chamber, 26 indicates an intake port to be opened and closed by the intake valve 16, 27 indicates an exhaust port to be opened and closed by the exhaust valve 17, and 28 and 29 indicate piston and connecting rod, respectively.

The valve system 18 on the engine 2 is to drive two each of the intake valves 16 and the exhaust valves 17. As shown in Fig. 2 and Fig. 4, the valve system 18 includes components such as an intake cam shaft 31 and an exhaust cam shaft 32 accommodated in the valve train cam

chamber 13 and each being arranged to be located above and below the cylinder axis line C, valve lifters 33 with which these cam shafts 31 and 32 are engaged via cams, and a valve spring 34 urging the intake valve 16 and the exhaust valve 17 to the closing direction. Driving systems for the intake valve 16 and for the exhaust valve 17 are constructed axisymmetrically relative to the axial line C of the cylinder 7.

Please replace the paragraph beginning on page 6, line 19 and ending on page 7, line 4 (starting with "As shown in Fig. 3") with the following rewritten paragraph:

As shown in Fig. 3, the cam accommodating spaces 40 to the left and the right are formed on the cylinder head 12 in the places corresponding to the intake valves 16 and the exhaust valves 17, and the bearings 35 and 36 located to the left are provided between the left and the right cam accommodating spaces 40. The bearings 37 and 38 located to the right are provided between a timing chain accommodating space 41 formed in the right end of the cylinder head 12, and those cam accommodating spaces 40 located on the right among the left and the right cam accommodating spaces 40 ~~and 40~~. A stopper 42, described in the sections below, is provided below the exhaust cam shaft bearing 36 that is one of the bearings 35 and 36 located on the left.

Please replace the paragraphs beginning on page 7, line 21 and ending on page 8, line 18 (starting with "As shown in Fig. 3 through Fig. 5") with the following rewritten paragraphs:

As shown in Fig. 3 through Fig. 5, the vertical wall 51 is extending downward from the left bearing 36 for the exhaust cam shaft 32, and the front end face 51a of the vertical wall 51 is included in the end area of the cylinder head 12 on the side of cylinder head cover 14. The stopper 42 is provided with a supporting plate 42a removably secured by the fastening screw 52 to the front end face 51a of the vertical wall 51, and stopper pieces 42b ~~and 42b~~ integrally formed on the supporting plate 42a at both ends along the scooter's width direction. The front end face 51a is formed so that it comes lower than a mating face 36a (refer to the Fig. 4) to which the cam cap on the bearing 36 is connected (so that it is located to the rear). Also, it is constructed such that head of the fastening screw 52 for securing the supporting plate 42a is in the position lower than the mating face 36a.

Each stopper piece 42b is provided extending to the rear and ~~to the~~ upward within the cam accommodating space 40 in parallel to both sides of the vertical wall 51 and the bearing 36.

As shown in Fig. 2 and Fig. 4, each stopper piece 42b on the stopper 42 is formed opposite to the top face 33a of each valve lifter 33 for the exhaust valves located lower than the axial line C of the cylinder 7. More specifically, as shown in Fig. 4, each stopper piece 42b is formed to be spaced from the top face 33a by a gap "d", and at the same time to face opposite to the top face 33a, when the circular base area of the cam 32a on the exhaust cam shaft 32 is cam-engaged with the top face 33a of the valve lifter 33 for the exhaust valve. In these two stopper pieces 42b, one stopper piece 42b located to towards the right faces to of the valve lifter 33 for the right exhaust valve, and the other stopper piece 42b located to towards the left faces to of the valve lifter 33 for the left exhaust valve.

Please replace the paragraph at page 9, lines 12-15 (starting with "Since the shims 44") with the following rewritten paragraph:

Since the shims 44 are a smaller part compared with the valve lifters 33, the shims 44 can be lost easily if they fall off together with the valve lifters 33. As described above, however, falling-off of the valve lifters 33 is prevented by the stopper 42, thus the shims 44 are prevented from falling off as well so as to prevent them from getting lost.